

AD250
MPEG-4/H.264
SD/HD Encoder
User manual

AD INSTRUMENTS

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Safety Instruction

The following are the important safety instructions that you need to know before operating this equipment. Please read and understand these notices before using the equipment.

- The operation and maintenance of this equipment must be handled by professionals.
- The equipment should be kept in a shady and cool place. Do not expose it to high temperature or sunlight.
- Please use the cable of good quality and make sure the connector is in good condition.
- Please do not use the power supply that doesn't match the requirement.
- Please do not open the machine cover.
- Keep 10mm space for ventilating.
- Keep the operating temperature within 0°C~40°C and the humidity within 10%~90% for long life-span.
- Please do not operate the machine in a humid condition.
- Please unplug the power supply cable under the following circumstances:
 - The power supply cable or the socket is damaged
 - Any liquid has been spilled into this equipment
 - The equipment has been collided or the components are damaged
- Unplug the equipment from wall outlet before cleaning. Please use dry cloth for cleaning

About this manual

This manual introduces the basic conception of AD250 Encoder of AD INSTRUMENTS, including the detailed description of installation, setup and operating method. Please read this manual carefully, especially the ‘**Notice**’ in the black frame, to insure the correct operation of AD250 Encoder.

Attention:

- Please use the cable with good quality and confirm the connector is in good condition.
- Please make sure the power source is qualified and do not use the power line without the earth wire.
- Please do not open the device cover privately

Chapter 1 Overview

1.1 Product introduction

AD250 Encoder is AD INSTRUMENTS's new generation of MPEG-4/H.264 SD/HD Encoder. It supports HDMI, HD/SD SDI, YPbPr, CVBS, SPDIF input and ASI and IP output. With improved algorithm and compression efficiency, it presents major improvements in picture quality, offering crisp and vibrant video at extremely low bit-rates. AD250 helps deliver more SD/HD video and audio channels in the available bandwidth, enabling the launch of additional SD/HD service in an existing digital video or an IPTV network.



Figure 1-1 Encoder-AD250

1.2 Function & Features

- Compatible with MPEG-4/H.264-AVC standard
- MPEG-1 Layer II audio encoding
- SD video input format: NTSC/PAL
- HD video input format: SMPTE-296/SMPTE-274
- Support HDMI, SD/HD SDI, YPbPr and CVBS input
- Digital SPDIF audio input
- Support multiplexing of MPEG-4 video and audio compressed data stream with DVB packets
- SI related table editing
- Support SD or HD TS stream output with the corresponding definition of input signal
- Two identical ASI outputs
- IP output compliant with UDP/RTP protocol (optional)
- Convenient and simple NMS for long-range management of the equipment

1.3 Front Panel

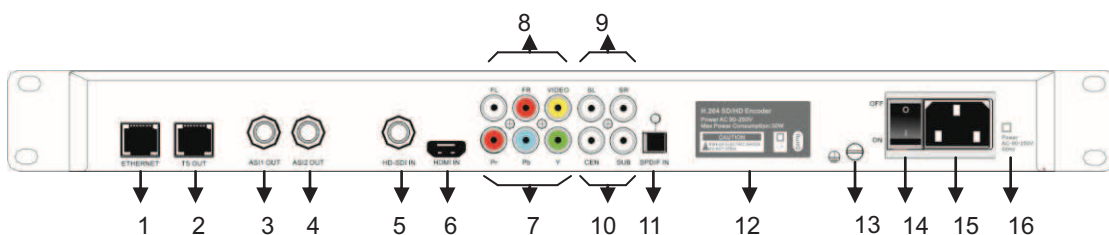


1. **Logo**: the company logo and the model of this equipment are displayed this area.
2. **Power indicator**: when you connect the power cord and start the equipment, this indicator will be light all the time.
3. **Lock indicator**: when the output stream is stable, this indicator will be light all the time.
4. **Alarm**: if there's any abnormality (e.g. there's no input stream or output stream.), this indicator will be light all the time.

Notice: when you switch options in the 'Encode Setup' menu, both 'Power' and 'Lock' indicators will go out within several seconds, and it's the normal phenomena.

5. **LCD Screen**: display content of the menu you are operating.
6. **Direction Keys**: switch different options in each menu via the four keys.
7. **MENU**: enter the main menu, cancel the modification or exit from any menu.
8. **OK**: enter submenus or confirm the modification of the parameters.

1.4 Rear Panel



1. **ETHERNET**: connect this port to your server to realize the remote management.
2. **TS OUT**: output the encoded stream as IP format.
3. **ASI1 OUT**: output the encoded stream as TS format.
4. **ASI2 OUT**: this output is just the same as ASI1 OUT.
5. **HD-SDI IN**: it supports both SD and HD SDI stream input with BNC interface.
6. **HDMI IN**: to encode the HD program, connect the HDMI cable to the port.
7. **YPbPr**: component YPbPr input.
8. **A/V**: video with CVBS format and audio input.
- 9/10. **AC-3 Audio IN**: the four ports with 'FL' and 'FR' together are used to input the Dolby digital AC-3 audio.
11. **SPDIF IN**: digital audio input with optical interface.
12. **Information**: Power AC, Max Power Consumption and CAUTION.
13. **Grounding**: the equipment should be earthed by connecting the ground wire.
14. **SWITCH**: turn ON or OFF the equipment.
15. **POWER**: connect the equipment and power supply with the power cord.
16. **Power Specifications**: AC 90~250V, 50/60 Hz.

<p>Notice: the function of 'AC-3 IN' and 'SPDIF IN' is not available temporarily; they're reserved for future use.</p>

Chapter 2 Operating instruction

Please make sure that all input/output cables are connected well. The parameters can be configured by the operation of buttons through the guide of menu displayed on LCD screen.


2. 1 Start up

Start up the encoder, after about 8 seconds, the LCD displays initial state:



AD INSTRUMENTS AD250
[V 1.0.0] booting.....

After start up, AD250 encodes automatically, LCD displays as follows:



AD INSTRUMENTS AD250
IP: 192.168.1.16

It includes the type and IP address of this equipment.

2. 2 Hierarchical menu

Operation menu is a multilevel menu. The first level is initial interface. Each menu item could have its own submenu. In the same way, each submenu item can have its own submenu too. Due to the limitation of word count displayed, it only can display one menu item at one time. Each menu item can display two lines of content: the first line is the name of menu item; the forepart of second line is the present value of adjustable parameter. The parameter can be modified in the process of encoding.

2.2.1 Menu structure:

CLASS1	CLASS2	CLASS3	CLASS4 (or Options)	DEFAULT PARAMETER
Main Menu	Encode Setup	Input Source	CVBS, HDMI, YPbPr, SDI	CVBS
		Parameter Setup	Video Encode Rate	10000
			Audio Encode Rate (32/64/128/192/256/320/384 Kbps)	256K
			Video PID	4113
			Audio PID	4352
			PCR PID	4097
			PMT PID	4096
			Program Number	1
			Transport Stream ID	0
			Program Name	Program-1
			Provider Name	Encoder
	TSIP Setup	IP Source Address		192.168.1.122
		UDP Source Port	>1024	1000
		Enable Channel	Enable, Disable	Enable
		Packet Size	188, 204	188
		TS Packets per RTP	1-7	7
		Type of Service	Normal, Min Delay, Max Throughput Max Reliability, Monetary Cost	Normal
		Protocol	UDP, RTP	UDP
		Time to Live	1-255	8
		UDP Destination Port	>1024	1234
		IP Dest Address	224.1.0.0 ~ 238.255.255.255	227.10.20.30
		Source MAC Address		01:02:03:04:05:06
	System	Local Setup	Host IP Address	192.168.1.16

			Host Gateway	192.168.1.1
			Host Subnet Mask	255.255.255.0
			Host MAC Address	A0:07:ED:0F:60:1F
		Language Select	English, Chinese	English
		Factory Setting	NO, YES	NO
		Version Information	Hardware Version	The current version
			Software Version	The current version

2.3 Menu flow rules

1. Due to the limitation of word count displayed, it is impossible to display all menu items in the same level. Menu items in the same level can be switched through the two buttons '↑↓'.
2. The parameter only can be modified in the end level menu. Press button 'OK' to entry the lower level menu when it chooses a non-end level menu.
3. There is more than one way to enter the lower level menu from the higher level menu.
4. Enter the end level menu, and modify the parameter and press 'OK' to save it. If it has no use for modifying the parameter value, press 'MENU' to return the next higher level menu and keep the former parameter value, or press 'OK' to confirm the former one.
5. During the process of encoding, LCD will return the initial interface automatically if any button operation stays on a menu item over 5 minutes.

Notice: to modify any parameter and save it, you need press 'OK' to enter the editing status firstly, and then press '↑→ ↓←' to select other options or input the parameter. Lastly, press 'OK' to save the new parameter.

2. 4 Operation of Front Panel

2.4.1 Encode Setup

- Input Source

Input Source
CVBS

▲The options includes: CVBS (A/V), HDMI, SDI and YPbPr, and you should select the right Input Source according to your application.

- Video Encode Rate

Video Encode Rate
10000

The range is 1000 ~ 20000 Kbps

- Audio Encode Rate

Audio Encode Rate
256K

Options: 32/64/128/192//256/320/384 Kbps

▲Input the Video Encode Rate value and select the Audio Encode Rate according to your request.

Notice: the larger you input/select the Video/Audio Encode Rate is, the broader bandwidth the program takes up.

- Video PID

Video PID
4113

- Audio PID

Audio PID
4352

- PCR PID

PCR PID
4097

- PMT PID

PMT PID
4096

▲The range of each PID value is: 1024 ~ 8175, you can input any value within this range according to your arrangement. However, be sure to set different PID for Video, Audio, PCR and PMT.

- Program Number

Program Number
1

- Transport Stream ID

Transport Stream ID
0

- Program Name

Program Name
Program-1

- Provider Name

Provider Name
Encoder

▲Input the information about the encoded program, including Program Number, Program Name, Transport Stream ID and Provider Name.

Tips: the Transport Stream ID is set for knowing this stream from other streams within the same broadcasting network.

2.4.2 TSIP Setup

- Enable Channel

Enable Channel
Enable

Open or close the output channel by select Enable or Disable.

- Packet Size

Packet Size
188

Select the TS packet size:
188 or 204 Byte

- TS Packets per RTP

TS Packets per RTP
7

Select the amount of TS packets in each RTP packet. The range is 1-7.

- Protocol

Protocol
UDP

Select the transmission format:
UDP or RTP.

- UDP Destination Port

UDP Destination Port
1234

Set the port for broadcasting the IP stream, it should be larger than 1024.

- IP Dest Address

IP Dest Address
227.10.20.30

Set the address for broadcasting the IP stream, the range is:
224.1.0.0~238.255.255.255

Notice: it's necessary to set different 'IP Dest Address' or 'UDP Destination Port' for every equipment when more than two equipments work as IP output mode within the same broadcasting network.

- Type of Service

Type of Service
Normal

- Time to Live

Time to Live
8

▲When the equipment transmits the IP stream to other broadcasting network by connecting TSIP port to the Router, the two parameters work. If you know little about them, keep them in default.

- IP Source Address

IP Source Address
192.168.1.122

- UDP Source Port

UDP Source Port
1000

▲The three parameters are used in the internal communication of the equipment, so you needn't modify them for normal application.

- Source MAC Address

Source MAC Address
01:02:03:04:05:06

2.4.3 System

- Host IP Address

Host IP Address
192.168.1.16

- Host Gateway

Host Gateway
192.168.1.1

- Host Subnet Mask

Host Subnet Mask
255.255.255.0

- Host MAC Address

Host MAC Address
A0: 07: ED: 0F: 60: 1F

▲The four parameters are set for the connection between equipment and its NMS running on your server.

Notice:

1. After you modify the four parameters and press MENU button to apply it, the equipment will restart automatically.

2. The 'Host IP Address' and the server's IP address, should be in the same network section; 'Host Gateway' and the server's gateway, 'Host Subnet Mask' and the server's Subnet Mask should be the same. For example:

Parameter	AD250	Server
IP Address	192.168.1.x (x: 3 ~254)	192.168.1.2
Gateway	192.168.1.1	192.168.1.1
Subnet Mask	255.255.255.0	255.255.255.0

3. When more than two pieces of AD250 are connected to the same server, it's necessary to set different 'Host IP Address' and 'Host MAC Address' for each one.

● Language Select

Language Select
English

▲If needed, you can change the menu language into Chinese or English.

● Factory Setting

Factory Setting
NO

YES

Factory Setting
Restart ...

▲You can set all the parameters back to the factory setting. If you select 'YES', it'll display as the right picture and restart automatically.

●Hardware Version

Version Information
Hardware Version

●Software Version

Version Information
Software Version

▲Press OK button on the front panel to query the current Hardware and Software version about the equipment.

2.5 Network management operation

2.5.1 Overview

The AD250 network management software is a remote management program based on web service, which can conduct a remote management on any computer running on windows98 system or above.

2.5.2 Software installation

With the network management software recorded on it, a CD is sent along with the machine. Put the CD into the disk driver and a compressed file package will show up, and then double click the file. Install decompression software first if there isn't one. After decompression, double click MNG_V1.0.0.exe to open the program and conduct a remote control.

2.5.3 Login interface

Double click MNG_V 1.0.0.exe, the login interface is like Fig 4-1, and then input the User and Password, both of them are 'admin' in default. Enter 'Login' to go to the interface like Fig 4-2.

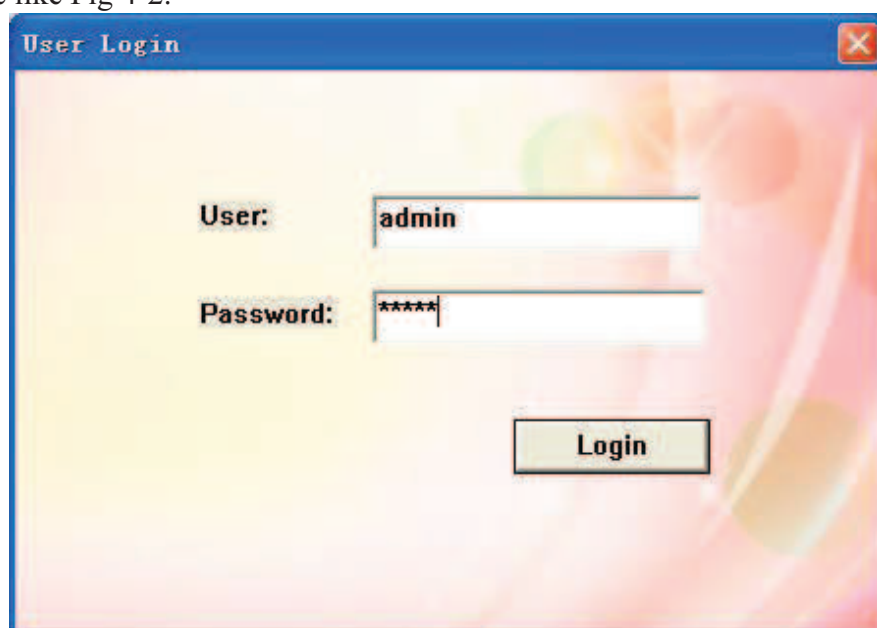


Fig 4-1

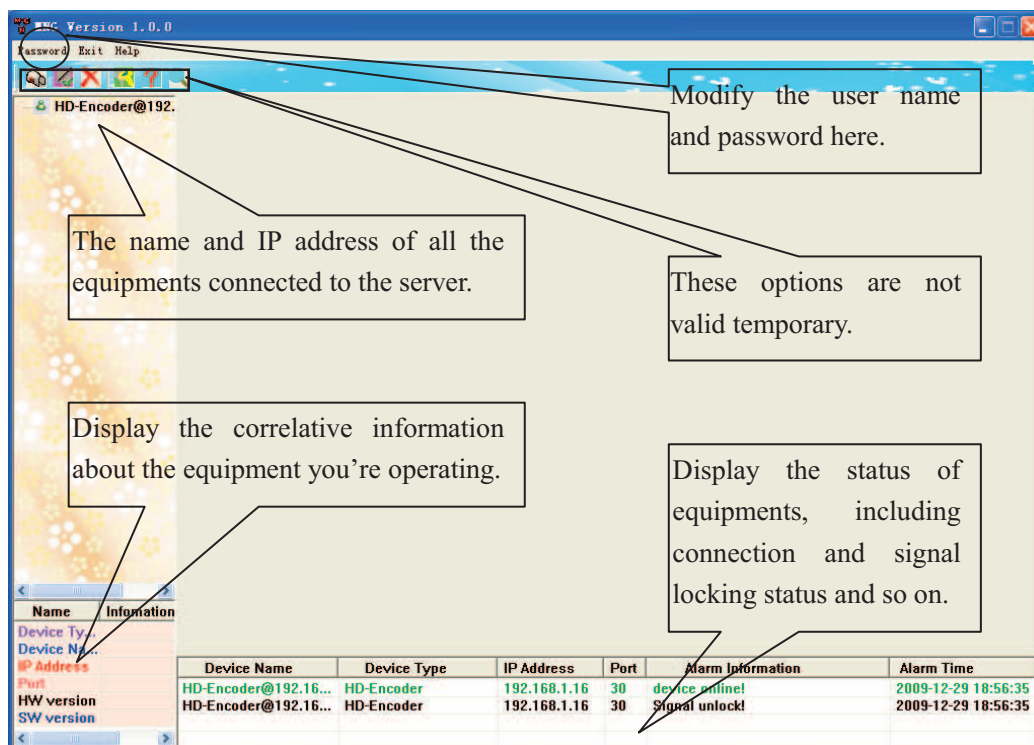


Fig 4-2

It's convenient to manage several equipments at the same time via the NMS. The NMS will read and display the name and IP address of all the equipments connected to the server automatically. Double click the equipment's name to enter the corresponding operation interface.

2.5.4 Operation interface

The operation interface is like Fig 4-3, there're four pages used to configure the equipment, including: Encoder, Ethernet, System and Upgrade. You'll see the 'Encoder' page as soon as entering this interface.

2.5.4.1 Encoder

You can set the basic parameters about encoding program here.

- **Input Source:** Select the corresponding option according to the actual input source, including: CVBS (A/V), HDMI, SDI and YPbPr.
- **Video Encode Rate:** the range is 1000 ~ 20000 Kbps.
- **Audio Encode Rate:** select an option from 32/64/128/192/256/320/384 Kbps.
- **Video/Audio/PCR/PMT PID:** the range is 1024 ~ 8175, you should set different PID for the four options.
- **Transport Stream ID:** set this ID to know the encoded stream from other streams in the same broadcasting network.
- **Program Name/ Number/ Provider Name:** input the correlative information of the encoded program.

- **Signal:** it'll display 'LOCK' when the encoded stream is transmitted successfully; otherwise it'll display 'UNLOCK'.

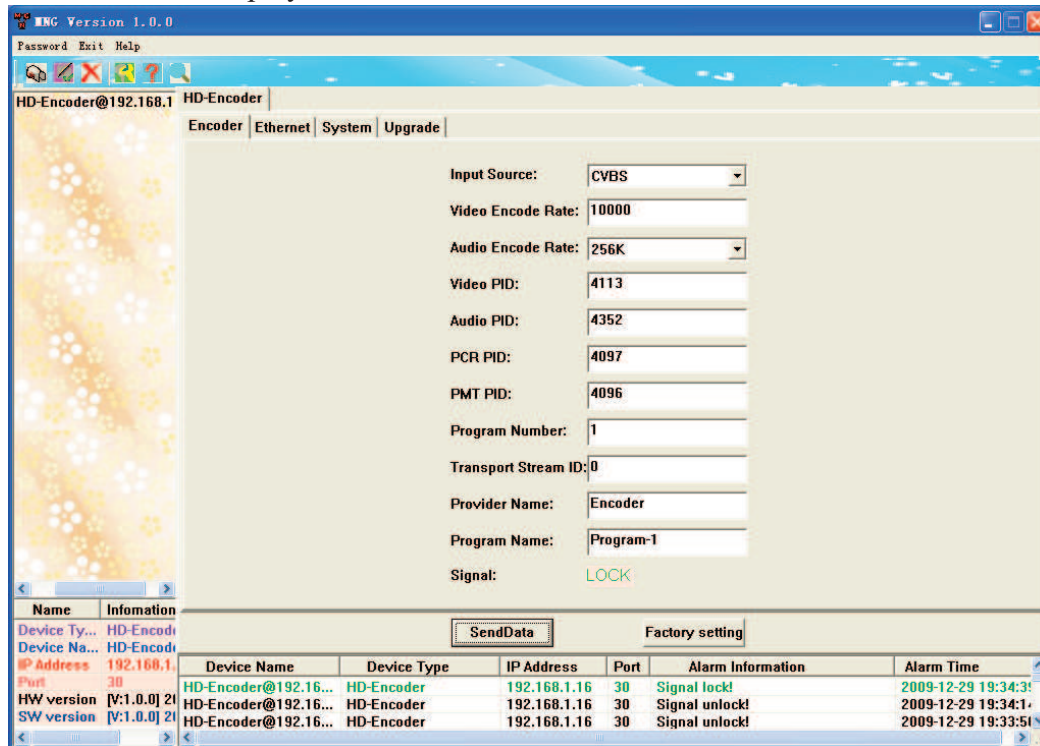


Fig 4-3 Encoder

Notice: After setting all the parameters of all the pages, you should press 'SendData' to save and apply it.

2.5.4.2 Ethernet

If you need the encoder outputs the stream as IP format, set the parameters here.

- **Enable Channel:** Open or close the IP channel by selecting Enable or Disable.
- **Source IP Address/ Source Port/ Source MAC Address:** The three parameters are used in the internal communication of the equipment, so you needn't modify them for normal application.
- **Dest IP Address:** set the parameter for broadcasting the IP stream. The range is 224.1.0.0 ~ 238.255.255.255
- **Dest Port:** set the parameter for broadcasting the IP stream. The number should be larger than 1024.
- **Protocol:** select the UDP or RTP protocol according to your request.
- **TS Packets per UDP:** Select the amount of TS packets in each RTP packet. The range is 1 ~ 7 and 7 is recommended.
- **PacketSize:** Select the TS packet size 188 or 204 Byte.
- **Time to Live/ Type of Service:** When the equipment transmits the IP stream to other broadcasting network by connecting TSIP port to the Router, the two parameters work. If you know little about them, keep them in default.

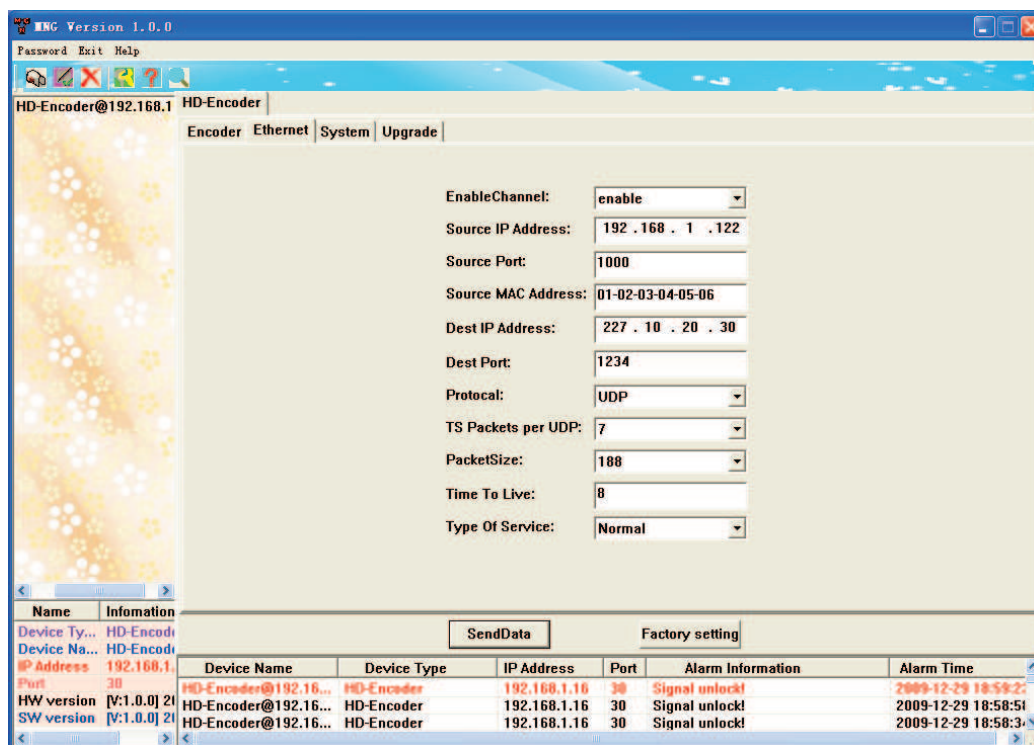


Fig 4-4 Ethernet

Notice: it's necessary to set different 'Dest IP Address' or 'Dest Port' for every equipment when more than two equipments work as IP output mode within the same broadcasting network.

2.5.4.3 System

You can modify or query the information about the equipment.

- **Host IP Address:** set the IP address for connecting the equipment to the NMS.
- **Host Subnet Mask/ Host Gateway:** the two parameters should be the same as your server's subnet mask and gateway.
- **Host MAC Address:** set the MAC address of this equipment.
- **Hardware/ Software Version:** the current hardware or software version installed in the equipment.

Notice:

1. After you modify the four parameters and press MENU button to apply it, the equipment will restart automatically.

2. The 'Host IP Address' and the server's IP address, should be in the same network section; 'Host Gateway' and the server's gateway, 'Host Subnet Mask' and the server's Subnet Mask should be the same. For example:

Parameter	AD250	Server
IP Address	192.168.1.x (x: 3 ~254)	192.168.1.2
Gateway	192.168.1.1	192.168.1.1
Subnet Mask	255.255.255.0	255.255.255.0

3. When more than two pieces of AD250 are connected to the same server, it's necessary to set different 'Host IP Address' and 'Host MAC Address' for each one.

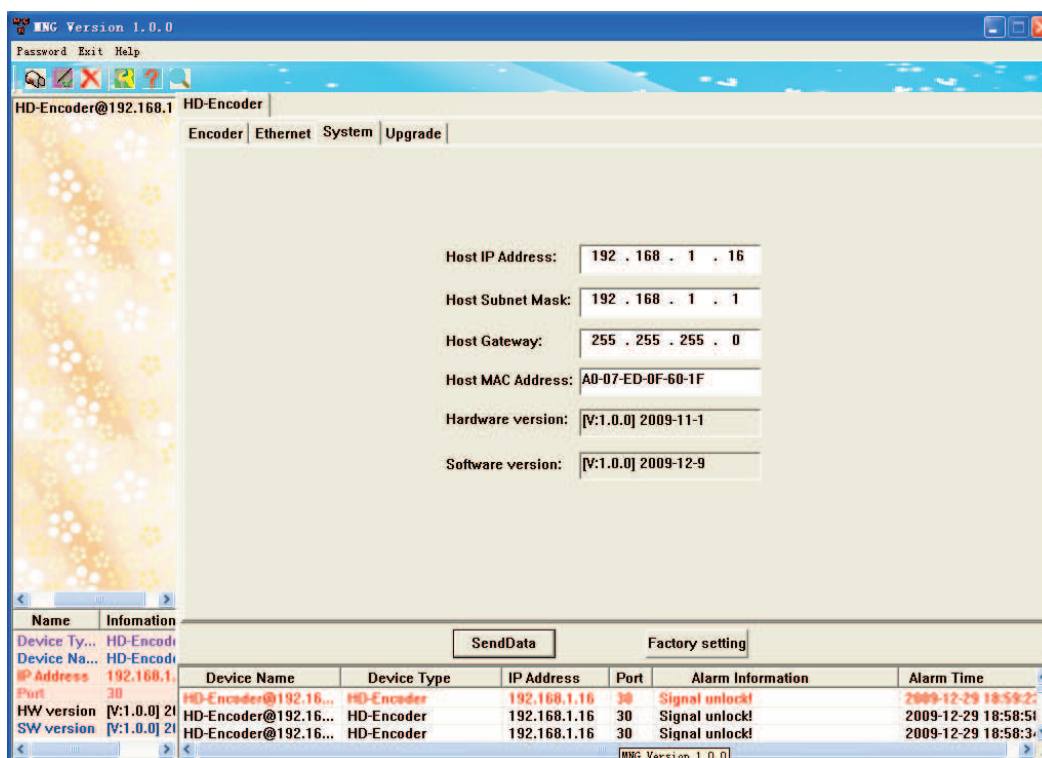


Fig 4-5 System

2.5.4.4 Upgrade

The NMS provides you a convenient and simple way to update the software, if you need the upgrade for the software. To complete the upgrade, you can follow the specific steps as below:

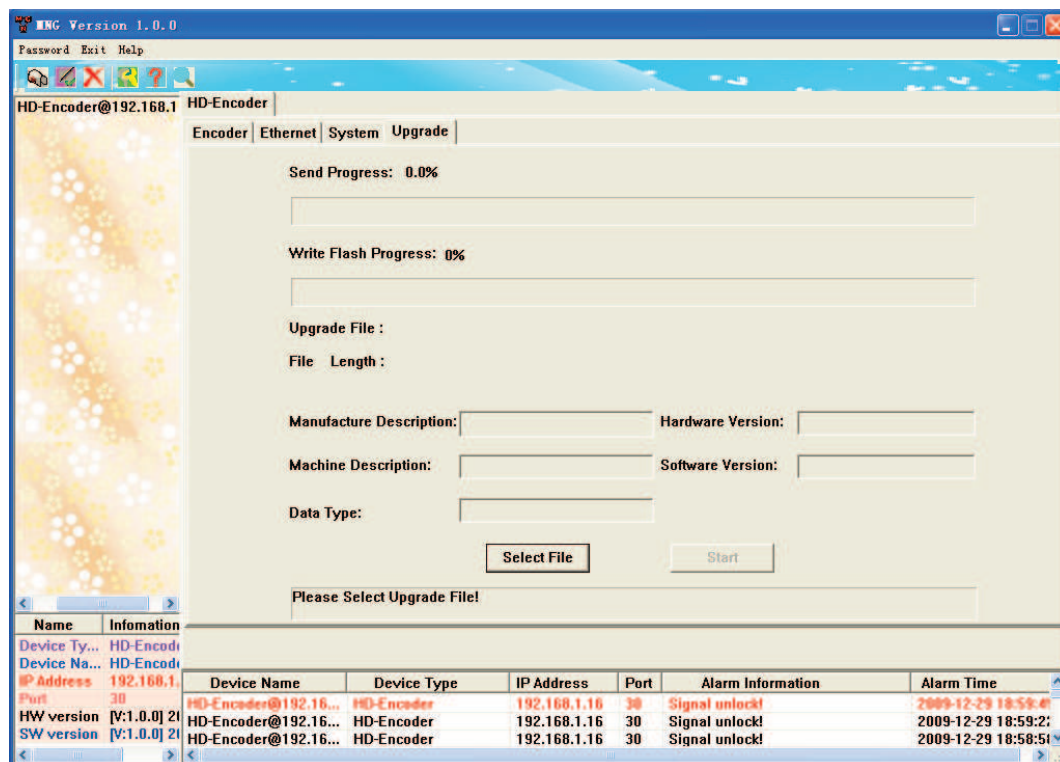


Fig 4-6 Upgrade

1. Click 'Select File', and select the upgrade software. Then click 'Open'.
2. Click 'Start' to begin the upgrade, and you can see the progress in the upgrade interface.
3. If the upgrade is successful, a message like Fig 4-8 will pop up to remind you, at the same time, the equipment will restart automatically.

Notice: During the process of upgrade, don't cut off the power supply and the connection between server and equipment, otherwise it would induce the destructive damage for the equipment.

Fig 4-8

Chapter 3 Trouble shootings

1. Why can't log on the equipment via the NMS?

If you're sure the cable connection is firm, you can make the following check:

■ Network blocking

Check network and make sure the network transmits fluently, and the checking is conducted at set intervals by the software, so the possibility can not be ruled out if a disconnection occurs.

■ IP address conflict or setting error.

Check IP address, and there is a default address as the device dispatched. Please modify it according to the actual IP address at its debut, and for easy management, do not randomly change the address once it was set up, because the correct IP address is directly related to the network management.

2. Why is there not output stream while the input signal is good?

If you're sure the monitor and equipment receiving the signal from AD250 are working normally, Please be sure

■ the resolution of input signal accords with the selected input source:

CVBS: 720 x 576 x 50i; 720 x 480 x 59.94i

YpbPr: 1080 x 720 x 50p; 1080 x 720 x 60p; 1920 x 1080 x 50i; 1920 x 1080 x 60i

HDMI: 1080 x 720 x 50p; 1080 x 720 x 60p; 1920 x 1080 x 50i; 1920 x 1080 x 60i

SDI: 720 x 576 x 50i; 720 x 480 x 59.94i; 1280 x 720 x 50p; 1280 x 720 x 60p; 1920 x 1280 x 50i; 1920 x 1080 x 60i

■ Bit rate overflows or is set too low.

Please check the video/ audio bit rate and adjust them to an adaptable range.

■ PID conflicts with the PID in other TS streams.

Check the Video/ Audio/ PCR/ PMT PID, and modify their PID and distribute different PID to them.

3. Why does the picture pause or is the picture color abnormal?

■ The program format (PAL/ NTSC) of the decoder and the input source of AD250 are not accordant.

Please check the program format, and adjust the whole system's format to be accordant, you'd better set the same format for the input source of AD250, the decoder and TV

4. Why is there a halt or mosaic in the picture?

■ For every equipment, if the total output bit rate beyond the max capacity of the equipment, there may be a halt or mosaic in the picture. So you should check and adjust the input or output bit rate of every equipment to make it accord with their specifications.

Chapter 4 Specifications

1. Physical Specifications

Temperature	Regular temperature	10~40℃ (50~104°F)
	Operating temperature	0~40℃ (32~104°F)
	Storage temperature	-20~80℃ (-4~176°F)
Power supply	Voltage range	90~250V (50/60Hz)
	Fuse type	250V, 3.0A
Power		30 W
Weight		3.5 KG
Dimension		44mm(H)×484mm(W)×274mm(D)

2. Input Specifications

Video	Signal	CVBS
	Level	1Vp-p±0.2
	Connector	RCA
	Impedance	75 Ω
Audio	Signal	non-balance audio input
	Level	2Vp-p±0.2
	Connector	RCA
	Impedance	600 Ω

3. Output Specifications

ASI output	Connector Type	BNC
	Impedance	75 Ω
	Transport stream format	Single channel transmit stream
	Transmit distance	>250m (with high quality coaxial cable)

4. Signal Specifications

Video mode	AUTO
Aspect Ratio	4: 3; 16: 9
Signal channel system bit rate	2M—20Mbps
video encode bit rate	1M—20Mbps
audio encode bit rate	32Kbps, 64Kbps, 128Kbps, 192Kbps, 256Kbps, 320Kbps, 384Kbps
Audio sample frequency	48KHz
Audio mode	STEREO, MONO
Output stream	MPEG-4/H.264 TS transmit format compliant , packet length 188 or 204

Chapter 5 Maintenance and Services

✧ Before sales services

1. A system project would be established based on fully acknowledge of the client's need.
2. Detailed solution would be provided to any forms of questions brought by clients.
3. The functions and features of our equipments would be introduced in detail.
4. Hardware configuration would be provided according to the actual needs of the system along with those of the client.

✧ After sales services

1. One year warranty is provided in normal operation. During this time, if there're any issues on the equipment in normal operation, we will be responsible for troubleshooting and maintenance. If necessary, further technical support shall be provided and you will receive our response within 24 hours in normal situation once we get your feedback.
2. Training program is scheduled for clients' system maintenance staff so that the operators can master the skill proficiently to make sure the system can run well.
3. 12-month warranty is provided from the day of dispatch. Malfunctions under regular use will be repaired for free. Provide lifetime paid services after 12 month.